

ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter of

1998 Biennial Regulatory Review -- Amendment of
Parts 2, 25 and 68 of the Commission's Rules to
Further Streamline the Equipment Authorization
Process for Radio Frequency Equipment, Modify the
Equipment Authorization Process for Telephone
Terminal Equipment, Implement Mutual Recognition
Agreements and Begin Implementation of the Global
Mobile Personal Communications by Satellite
(GMPCS) Arrangements

GEN Docket No. 98-68

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

COMMENTS OF ORBITAL COMMUNICATIONS CORPORATION

Orbital Communications Corporation ("ORBCOMM") hereby comments on the Commission's modification of its equipment authorization processes to further streamline the regulatory requirements and to account for international developments -- the adoption of mutual recognition agreements and the adoption of global mobile personal communications by satellite ("GMPCS") arrangements.¹ ORBCOMM is very interested in this proceeding because of its role

¹ 1998 Biennial Regulatory Review -- Amendment of Parts 2, 25 and 68 of the Commission's Rules to Further Streamline the Equipment Authorization Process for Radio Frequency Equipment, Modify the Equipment Authorization Process for Telephone Terminal Equipment, Implement Mutual Recognition Agreements and Begin Implementation of the Global Mobile Personal Communications by Satellite (GMPCS) Arrangements, Notice of Proposed

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as a leader in the development of low-Earth orbit ("LEO") mobile satellite services² and as the first commercial licensee and operator of a LEO satellite system.³ In particular, ORBCOMM supports the Commission's moving ahead quickly with the implementation of the GMPCS arrangements through adoption of interim equipment approval procedures (prior to permanent domestic implementation of the GMPCS arrangements through a soon to be initiated proceeding). In addition, ORBCOMM supports interim out-of-band emissions limits placed on L-band mobile satellite systems in the Notice as a means of protecting the Global Positioning System ("GPS") satellites.

Unlike geostationary satellites, which maintain a fixed position relative to the surface of the Earth, LEO satellites constantly move relative to the Earth's surface. Therefore, in order to ensure continuous service to any particular area (such as the United States), a LEO operator must deploy a constellation of satellites so that one or more satellites will be in range of a subscriber even as the other individual satellites move out of view. As a result of this constant movement of the constellation of satellites, LEO systems are inherently global, insofar as the satellites will

Rulemaking, GEN Docket No. 98-68, FCC 98-92, released May 18, 1998 (hereafter cited as "*Notice*").

² The data-only satellite services using spectrum below 1 GHz are commonly known as Little LEO satellite services, and are alternatively referred to as Non-Voice, Non-Geostationary Mobile Satellite Services ("NVNG MSS").

³ ORBCOMM filed the petition for rulemaking to allocate spectrum and develop service rules for Little LEO satellite services back in February, 1990. *Orbital Communications Corporation*, RM No. 7334, Public Notice Report No. 1814, April 4, 1990. The Commission subsequently adopted the proposed allocation, *Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed-Satellite Service and the Mobile-Satellite Service for Low-Earth Orbit Satellites*, Report and Order, 8 FCC Rcd 1812 (1993), and ultimately licensed ORBCOMM's NVNG MSS satellite system. *Orbital Communications Corporation*, Order and Authorization, 9 FCC Rcd 6476 (1994); *recon. denied*, 10 FCC Rcd 7801 (1995).

overfly all of the Earth's surface and thus can provide service practically everywhere on the planet. This global nature of the LEO satellite systems raises new international regulatory issues, one of which is being addressed by the *Notice* -- the adoption of interim equipment approval procedures to help support the rapid implementation of GMPCS arrangements.

The global nature of the LEO satellite systems provides enormous public benefits and a country can cost-effectively access the satellites and take advantage of those advanced services. For example, the up-front investment in systems using a gateway Earth station can be very modest.⁴ As a result, satellite services are within the financial reach of nearly every country or region. LEO satellite systems thus support global universal service.

Likewise, subscribers benefit from the global reach of the LEO satellite systems. With their individual transceivers, businessmen can maintain contact no matter where on Earth they are traveling, and recreational travelers can send for help no matter how remote the area to which they have gone. For applications such as cargo tracking, the container can be located throughout its travels.

The United States, and indeed the rest of the world, recognized these numerous benefits when they allocated spectrum for global, LEO satellite systems.⁵ In order to maximize the

⁴ In the case of the ORBCOMM system, a gateway Earth station and network control center to make service available within a country costs approximately \$2.5 million. Moreover, the cost can be further reduced to the extent that several countries could share a single gateway Earth station and network control center. Indeed, in the Mahgreb region, several countries will be sharing an Earth station that is located in Morocco.

⁵ International Telecommunications Union, Final Acts of the World Administrative Radio Conference (WARC-92), Malaga-Torremolinos (1992); *Amendment of Section 2.106 of the Commission's Rules to Allocate the 1610-1626.5 MHz and the 2483.5-2500 MHz Bands for Use by the Mobile-Satellite Service, Including Nongeostationary Satellites*, 9 FCC Rcd 536 (1994); *Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed-*

capabilities of these systems, regulatory impediments to the global availability of LEO satellite services must be eliminated or minimized. While the global nature of LEO satellite systems produces unique benefits, the global nature of these services also creates some new and unique regulatory challenges.

One such problem confronting LEO satellite systems was the potential difficulty of coordinating a system whose transmissions would enter virtually every country in the world. Use of the traditional country-by-country bilateral coordination could delay or prevent deployment of the LEO satellite systems while that cumbersome process ambled towards completion. In order to forestall these adverse effects of traditional international coordination procedures, the ITU developed special new procedures for LEO satellite systems when it allocated spectrum at WARC-92. First, Resolution 46 procedures create a publication form of notice to the countries of the world with regard to the satellite system parameters, and limit the time in which affected countries must affirmatively indicate an interest in coordinating one of their satellite systems with the administration sponsoring the LEO satellite system. Under these procedures, failure to object during the four month period is deemed to be assent. Second, with respect to coordination with terrestrial services, WARC-92 established downlink power thresholds, and if the satellite system does not exceed that power level, then coordination with the terrestrial services in the band is not required.⁶ These special procedures have proven effective in preventing the

Satellite Service and the Mobile-Satellite Service for Low-Earth Orbit Satellites, 8 FCC Rcd 1812 (1993).

⁶ Under International Footnote 599A to the Table of Frequency Allocations, coordination of Little LEO satellites with terrestrial services in the 137-138 MHz band is only required if the power flux density of the satellite downlink exceeds - 125 dB(W/m² 4 kHz) at the Earth's surface. Similarly, for the Big LEO satellites, International Footnote 753F (cross-referencing RR

international coordination process from becoming a potentially insurmountable barrier to deployment of these global satellite systems.

The *Notice* addresses a similar issue raised by the global nature of LEO satellite systems -- the ability to use the same subscriber communicator to roam among multiple countries. The ability of a subscriber to use his or her unit globally would be frustrated if that unit was subject to tariffs, duties, confiscation or testing and/or approval requirements separately in each country. A number of regulators, manufacturers and system operators convened under the auspices of an ITU World Telecommunications Policy Forum to address this issue. The ITU and the Policy Forum undertook the development of a Memorandum of Understanding and a set of GMPCS Arrangements to support regulations that would foster global roaming, including blanket licensing, national type approval, marking, traffic information and customs recommendations.⁷

The *Notice* addresses preliminary implementation of the MOU and GMPCS Arrangements with an interim equipment authorization procedure until more detailed regulations can be adopted.⁸ The Commission recognizes that LEO satellite systems are already operational (including ORBCOMM's⁹), so that some immediate steps must be undertaken to promote the

2566) specifies the coordination threshold values for the 2483.5-2500 MHz band, which vary from - 152 to - 142 dB (W/m² 4 kHz), depending on the angle of arrival.

⁷ *Notice* at ¶ 37.

⁸ *Notice* at ¶ 45.

⁹ ORBCOMM launched its first two satellites in 1995, and began limited commercial service. ORBCOMM since that time has launched and tested additional satellites, and will have a total of 28 satellites launched by the third quarter of this year. With those 28 satellites on orbit, ORBCOMM will be able to offer near real time service. ORBCOMM will subsequently expand

global roaming of subscriber communicators operating with these working systems.

At present, Little LEO subscriber communicators do not require Commission equipment certification. Rather, the Commission's Rules provide for blanket licensing of the user terminals.¹⁰ In the blanket application, the applicant must demonstrate that the subscriber communicators will conform to the technical requirements for the Little LEO service, including duty cycles and power limits. ORBCOMM made such a demonstration in its blanket license application, which was granted by the Commission in 1995.¹¹

The *Notice* would provide an interim procedure to allow ORBCOMM and other LEO satellite system operators and subscriber communicator manufacturers to obtain equipment certification from the Commission in addition to the blanket license. Such equipment certification, in conjunction with the reciprocity and marking provisions of the GMPCS MOU and Arrangements, would facilitate global roaming of Little LEO terminals. The equipment certification would be based on meeting all of the relevant Part 25 and Part 1 standards, until permanent equipment certification rules are developed.¹²

ORBCOMM supports the Notice's interim equipment certification procedures. As an operational system that is seeking to obtain operating authority in numerous countries, ORBCOMM would find it very helpful to be able to take advantage of the ITU's new program

its constellation to 48 satellites to improve coverage, capacity and availability.

¹⁰ 47 C.F.R. § 25.135.

¹¹ *Orbital Communications Corporation*, Blanket Subscriber Terminal Authorization, 10 FCC Rcd 6572 (1995).

¹² *Notice* at ¶ 45.

for registry of GMPCS terminals. The Commission certification of the equipment will allow ORBCOMM to make the necessary filings and thereby obtain authority to use the ITU mark. In this regard, ORBCOMM urges the Commission expeditiously to implement procedures for filing with the ITU on behalf of satellite system operators and manufacturers as a corollary to the interim procedures for equipment certification being adopted in this proceeding.

The Commission's equipment certification, in conjunction with the ITU mark program, will allow ORBCOMM to avoid having to repeat in each country the detailed demonstrations of how the ORBCOMM subscriber communicators are designed to avoid interference to terrestrial services operating in the 148-150.05 MHz band. Particularly in the satellite arena, the United States is recognized as a "leader" by many nations, so the FCC imprimatur (along with the ITU mark) will facilitate the ability of ORBCOMM's subscriber units to roam freely across borders. Moreover, ORBCOMM's extraordinary efforts to bring its Little LEO satellite services to market as rapidly as possible would be frustrated if country-by-country regulatory red tape slowed the availability of these beneficial services. The Notice's interim equipment certification procedures would avoid the need to await the adoption of permanent certification procedures and standards, and such Commission certification would help minimize the unnecessary regulatory delays that ORBCOMM faces as it obtains country-by-country authority to offer service.

ORBCOMM thus urges the Commission to adopt the Notice's interim equipment certification process whereby the applicant would be required to demonstrate compliance with the current Part 25 and Part 1 requirements. ORBCOMM also urges the Commission to make clear that the interim procedures apply to Little LEO satellite services as well as the Big LEO satellite systems. The text of the *Notice* makes no distinction between Little LEO and Big LEO

satellite systems, and indeed explicitly acknowledges that ORBCOMM's Little LEO system falls under the GMPCS umbrella.¹³ Inexplicably, however, proposed new Section 25.200 addresses equipment authorization only for subscriber terminals in the 1610-1626.5 MHz band, *i.e.*, the Big LEO uplink bands. ORBCOMM urges the Commission to modify Section 25.200 to specify that the interim equipment certification procedures apply to mobile satellite earth terminals operating in the 148-150.05 MHz band (*i.e.*, Little LEO uplinks) as well as the 1610-1626.5 MHz band. In addition, ORBCOMM urges the Commission to clarify that satellite system operators who previously received a blanket license for subscriber communicators could continue to operate pursuant to that authority while the Commission reviewed the equipment certification application(s).¹⁴ These changes to proposed Section 25.200 will ensure that the benefits of the interim equipment certification procedures inure to all GMPCS systems, consistent with the intent of the Commission.¹⁵

¹³ Notice at n. 29.

¹⁴ As ORBCOMM indicated previously, it was required to demonstrate in its blanket license application how it would comply with all of the Part 25 requirements, as well as the compliance with the safety levels for exposure to radio frequency electromagnetic fields. Thus, continued operation under the blanket license would not pose any safety or interference risks.

¹⁵ ORBCOMM suggests the following modifications to Subsection (a) of proposed Section 25.200 (with proposed Subsections (b) and (c) remaining unchanged), with the additions underlined:

“(a) Mobile earth station satellite terminals for use in the band 148-150.05 MHz or 1610-1626.5 MHz must be authorized by the Commission under its certification procedure for use under this part, provided, however, that Mobile satellite systems that received a blanket license under Section 25.115(d) and/or Section 25.135 prior to August XX, 1998, may continue to operate mobile earth station terminals pursuant to that blanket license pending Commission action on the certification application(s) for mobile earth terminals operating with that Mobile satellite system. The certification procedure is found in Subpart J of Part 2 of the Rules.

In discussing interim equipment certification procedures for the 1610-1626.5 MHz band, the *Notice* also mentions specific out-of-band emission limits to protect the GPS operations. ORBCOMM supports these strict emission limits. The ORBCOMM satellites incorporate GPS receivers, and rely on the GPS satellites for system timing information as well as accurately determining the position of ORBCOMM's satellites. This information in turn allows some ORBCOMM subscriber communicators to determine the location of the user based on Doppler measurements. In addition, for certain applications where the Doppler measurements will not provide the necessary degree of accuracy, many of the ORBCOMM subscriber communicators will directly incorporate GPS receivers in the unit.¹⁶ ORBCOMM thus believes that it is very important that the Big LEO satellite systems avoid causing harmful interference to the GPS transmissions, and the out-of-band emission limits will minimize the risk of any such harmful interference by the Big LEO systems. ORBCOMM believes the out-of-band limits proposed in the *Notice* for the Big LEO transmitters will provide adequate protection to the GPS operations, and that the limits should be readily achievable for the Big LEO transmitters using good design techniques and filtering. ORBCOMM therefore also supports incorporation of the out-of-band emissions limits as part of the interim equipment certification process.

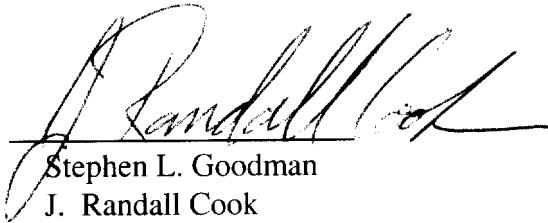
In sum, ORBCOMM urges the Commission to adopt the *Notice*'s interim equipment certification procedures, with the clarifications suggested by ORBCOMM to ensure that its Little LEO satellite system will be covered by those procedures. ORBCOMM also supports the out-of-

¹⁶ Using the Doppler measurements, the ORBCOMM subscriber communicators can determine the location of the user with an accuracy of approximately +/- 500 meters. By including a GPS receiver in the ORBCOMM subscriber communicator, the accuracy can be increased to approximately +/- 50 meters.

band emissions limits in the Notice for the Big LEO satellite systems as a means of protecting the GPS operations from harmful interference. Such action by the Commission will facilitate the global availability of GMPCS such as ORBCOMM's two-way messaging and position determination services, and thereby well serve the public interest.

Respectfully submitted,

By

A handwritten signature in dark ink, appearing to read "J. Randall Cook", written over a horizontal line.

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